# STEVEN CREECH

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## EDUCATION

**Brown University** *Fall 2020 - Present*
PhD in Mathematics Advisors: Jeff Hoffstein, Junehyuk Jung
(Masters awarded in Spring 2022)

**Georgia Institute of Technology** *Fall 2016 - Spring 2020*
Bachelor of Science in Mathematics with a Concentration in Pure Math Undergraduate
Overall GPA: 3.93/4
Major GPA: 4.0/4.0

## PAPERS

1. "Second Moment of Central Values of Half-Integral Weight Modular Forms and Subconvexity". With Henry Twiss, Zhining Wei, Peter Zenz. Preprint: https://arxiv.org/abs/2512.20483
2. "Explicit zero-free regions for automorphic $L$-functions". With Alia Hamieh, Simran Khunger, Kaneenika Sinha, Jakob Streipel, Kin Ming Tsang. Preprint: https://arxiv.org/abs/2509.20873
3. "Cancellation in Sums of Hecke Eigenvalues Over Quadratic Polynomials and Mass Equidistribution". Preprint: https://arxiv.org/abs/2508.18666
4. "A Formula For the Number of $k$-almost Primes". Preprint: https://arxiv.org/abs/2310.14989
5. "A Converse Theorem in Half-Integral Weight". With Henry Twiss. Preprint: https://arxiv.org/abs/2306.02872 Submitted to Journal of Number Theory.
6. "Limits and Colimits in the Category of Pastures". Preprint: https://arxiv.org/abs/2103.08655
7. "Prym–Brill–Noether loci of special curves". With Yoav Len, Caelan Ritter, Derek Wu. In International Mathematics Research notices, rnaa207.
8. "Extensions of Hyperfields". Preprint: arxiv.org/abs/1912.05919.

## OTHER CONTRIBUTIONS

1. Summer 2025, Contributed to the PNT+ formalization project in LEAN
2. Spring 2025, Contributed to Google Deepminds Alpha Geometry
3. "Promoting Students' Sense-Making in Row Reducing Matrices: A Lesson Analysis Manuscript". With Jordan Kostiuk, Drew Lewis, Tainara Borges, Madeline Brandt, Megan Chang-Lee, Samuel Freedman, Sarah Griffith, Sachi Hashimotohttps://doi.org/10.1080/10511970.2025.2518531

## SEMINAR PRESENTATIONS

Fall 2025, Rutgers University Number Theory Seminar, Talk, "Sums of Hecke Eigenvalues and Mass Equidistribution"

Fall 2025, Brown University Algebra Seminar, Talk, "Explicit Zero Free Regions for Automorphic $L$-functions"

Fall 2025, University of Virginia Number Theory Seminar, Talk, "Sums of Hecke Eigenvalues and Mass Equidistribution"

Spring 2025, Georgia Institute of Technology Number Theory Seminar, Talk, "Bounds on Hecke Eigenvalues over Quadratic Progressions and Mass Equidistribution on Cocompact Surfaces"

Fall 2024, University of Minnesota Graduate Student Number Theory Seminar, Talk, "Bounds on Hecke Eigenvalues over Quadratic Progressions and Mass Equidistribution on Cocompact Surfaces"

Fall 2024, Brown University Algebra Seminar, Talk, "Bounds on Hecke Eigenvalues over Quadratic Progressions and Mass Equidistribution on Cocompact Surfaces"

Fall 2024, University of Connecticut Algebra Seminar, Talk, "Bounds on Hecke Eigenvalues over Quadratic Progressions and Mass Equidistribution on Cocompact Surfaces"

Fall 2019, Georgia Tech Algebra Seminar, Joint Talk with Derek Wu, "Prym–Brill–Noether Loci of Special Curves"

## CONFERENCE PRESENTATIONS

Winter 2026, Joint Mathematics Meeting, Invited Talk in special session on Rethinking Number Theory: Highlighting the Research and Discussions of the RNT Workshops, "Computing Iwasawa Algebras of the pro-p Iwahori Subgroup of $\mathrm{GL}(n)$".

Fall 2025, Eastern AMS Sectional, Invited Talk in special session on Unveiling Connections: Number Theory Meets Algebraic Geometry, "Sums of Hecke Eigenvalues and Mass Equidistribution"

Fall 2025, Maine-Québec Number Theory Conference, Talk, "Modular Murmurations and Trace Formulas".

Summer 2025, 37th Automorphic Forms Workshop, Talk, "An Explicit Zero Free Region for Automorphic $L$-functions".

Winter 2024, Palmetto Number Theory Series XXIX, Talk, "An Explicit Zero Free Region for Automorphic $L$-functions".

Fall 2024, Maine-Québec Number Theory Conference, Talk, "Mass Equidistribution: Cocompact vs. Non-Cocompact Surfaces"

Fall 2024, Palmetto Number Theory Series XXXVIII, Talk, "Mass Equidistribution: Cocompact vs. Non-Cocompact Surfaces"

Fall 2024, 36th Automorphic Forms Workshop, Talk, "Mass Equidistribution: Cocompact vs. Non-Cocompact Surfaces"

Fall 2023, Palmetto Number Theory Series XXXVI, Talk, "A Converse Theorem in Half-Integral Weights"

Fall 2023, Maine-Québec Number Theory Conference, Talk, "Explicit Zero Free Regions of Automorphic $L$-Functions"

Spring 2022, AMS New England Graduate Student Conference, Talk, "Prym Tableau"

Winter 2020, Joint Mathematics Meeting, Poster, "Polynomials Over Hyperfields" (Outstanding Poster Award)

Summer 2019, Young Mathematicians Conference, Joint Talk with Caelan Ritter and Derek Wu, "Prym Varieties of Folded $k$-gonal Chains of Loops"

Summer 2019, Young Mathematicians Conference, Talk, "Hyperfield Extensions"

Spring 2019, National Conference on Undergraduate Research, Poster, "On Polynomials Over Hyperfields"

## WORKSHOPS

2025, Simons Foundation Workshop, LEAN for Mathematicians

2025, Ariziona Winter School, Representation Theory of $p$-adic Groups

2024, Rethinking Number Theory 5, Karol Koziol's group on calculating the Iwasawa Algebra of the pro-$p$ Iwahori subgroup of $\mathrm{GL}_3(\mathbb{Z}_p)$

2024, Arizona Winter School, Abelian Varieties

2023, Inclusive Paths in Explicit Number Theory, Alia Hamieh's group on computing explicit zero-free regions for automorphic $L$-functions

2023, Arizona Winter School, Unlikely Intersections

## AWARDS & SCHOLARSHIPS

Brown University Outstanding Graduate Teaching Award (2024)

Georgia Institute of Technology Undergraduate Mathematics Prize (2019)

Mehta Phingbodhipakkiya Undergraduate Memorial Scholarship (2019)

Zell Miller Scholarship (2016-2020)

## TEACHING EXPERIENCE

**Lecturer**
*Brown University*

- Linear Algebra (Spring 2024, Fall 2024)
- Calculus 2 (Spring 2023)
- Calculus 1 (Fall 2022)

**Teaching Assistant**
*Brown University*

- Special Topics Course on Euclidean Geometry and AI (Fall 2025)
- Calculus 2 (Fall 2023)
- Calculus 3 (Sping 2022)
- Calculus 2 (Fall 2021)

**Directed Reading Program**
*Brown University*

- Quadratic Forms (Fall 2025)
- $p$-adic Analysis (Summer 2025)
- Representations of Lie Groups (Fall 2024-Spring 2025)
- Representation Theory (Fall 2023, Spring 2024)
- Geometry of Numbers (Fall 2022)
- Quadratic Forms (Spring 2022)
- Sheaf Cohomology (Fall 2021)
- Combinatorics (Spring 2021)
- Tropical Geometry (Fall 2020)

**Teaching Assistant**
*Georgia Tech School of Mathematics*

- Calculus for the Life Sciences (Spring 2020)
- Introduction to Linear Algebra (Fall 2019)
- Introduction to Discrete Mathematics (Spring 2019)
- Introduction to Linear Algebra (Fall 2018)

**Georgia Tech School of Mathematics**
*Grader*

- A Second Course in Linear Algebra (Spring 2020)
- A Second Course in Linear Algebra (Fall 2019)
- Combinatorial Analysis (Spring 2019)
- A Second Course in Linear Algebra (Fall 2018)
- Applied Combinatorics (Spring 2018)
- Applied Combinatorics (Fall 2017)

**Ross Mathematics Program**
*Counselor/Lecture Assistant/Lecturer*

- Gave an advanced lecture course on quadratic forms (2023)
- Served as a lecture assistant for Provability Course (2022)
- Served as a lecture assistant for Rational Points on Curves course (2021)
- Served as a lecture assistant for Geometric Group Theory course (2020)
- Served as a lecture assistant for Professor Daniel Shapiro's Sums of Squares course (2018)

## OUTREACH & LEADERSHIP

**Brown University Horizons Seminar** Fall 2024-Present
*Co-organizer*

**AMS New England Graduate Student Seminar** Spring 2023-Present
*Co-organizer*

**Brown Graduate Student Seminar** Fall 2021-Spring 2025
*Co-organizer*

**Club Math** Spring 2017- Spring 2020
*President/Officer*

**Sci-Cycle** Fall 2019
*Organizer* *Advisor: Professor Evans Harrell*

**National Mathematics Festival** Summer 2019
*Volunteer*

**Mathapalooza Exhibit** Spring 2019
*Lead Student Organizer* *Advisor: Professor Evans Harrell*

**Seven Bridges of Königsberg Show** Fall 2018
*Lead Student Organizer* *Advisor: Professor Evans Harrell*